Adrien Brochier on Cyclotomic Associators and Finite Type Invariants for Tangles in the Solid Torus

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5:08 AM

$I_m \subset \mathbb{Q}[T_X]$ X: skeleton

$\Uparrow$ T_X: Tangles w/ that skeleton

The vassiliev filtration

I_m / I_{m+1} is finite dimensional.

Let M be a surface; study tangles in $M \times I$.

The resulting vassiliev quotients are not f.d. anymore.

The braid group for a surface:

$$P_n(M) = \pi_1(\mathrm{Conf}_n(M))$$

$$K_n \to P_n(M) \longrightarrow \pi_1(M)^n$$

@ group algebra level:

$$I_n \longrightarrow \mathbb{Q}[P_n(M)] \to \mathbb{Q}[\pi_1(M)^n]$$

If G is a finite quotient of $\pi_1(M)$, get

$$I_{n,G} \longrightarrow \mathbb{Q}P_n(M) \longrightarrow \mathbb{Q}G^n$$

$P_{n,G}$ is "braids pure in a G-cover".

Get G-finite-type invariant....

<u>Fact</u> If $\pi_1(M)$ is residually finite then

$$\bigcap_{\substack{\text{finite}\\\text{quotients}\\ G}} I_{n,G} = I_n$$

<u>Conjecture</u> There exist a morphism

$$P_n(M) \longrightarrow gr(K P_{n,G} \rtimes G)^\times$$

Conjecture is true for $M = S^2$, for $M = T^2$ with $K = \mathbb{Q}$. with $K = \mathbb{C}$ also true for arbitrary surfaces $G = 1$

true for $K = \mathbb{Q}$, $M = \mathbb{C}^\times$, $G = \mathbb{Z}/n\mathbb{Z}$
--- this is today's talk.

If $M = \mathbb{C}^\times$, $P_n(\mathbb{C}^\times) \cong P_{n+1}$ ....
See video....